THE ADVOCATE OF SCIENCE.

[. 1.] KNOWLEDGE IS POWER—HAPPINESS—VIRTUE. [Nos. 37 & 38.

Wm. P. Gibbons, cor. of 6th and Cherry sts. PHILADELPHIA, TWELFTH MONTH 5, 1833. Semi-monthly.—One dollar for 50 Numbers

For the Advocate of Science.

GEOLOGY, No. 20.

y last number I considered several of the arguments in favor of the ble origin of mineral coal. I will complete the subject in my present

ument founded on petrified vegetables.—Not only are vegetable im- ns discovered in profusion among the coal strata, but the vegetable frequently occurs in a petrified condition, and retaining its original Reeds have been found between coal strata, several inches in dia- , and flattened, evidently by the weight of the superincumbent layers. fact has been advanced in support of the vegetable origin of coal.

e inference not a good one.—But although vegetable petrifactions are in such abundance in coal mines, yet the plant is never converted into but generally into slate. Hence, if this argument prove any thing, it s that slate has a vegetable origin, as well as coal. It is, indeed, a singular that of all the relics of vegetation scattered through the coal ation, none are found changed into coal, so as to retain indications of original structure other than their external form.

neral charcoal found in coal.—There is a substance found among coal, hich the name *mineral charcoal* is sometimes applied, on account of its blance to charcoal. It occurs in thin layers between the layers of In the Schuylkill coal it is particularly abundant. Its texture re- bles that of common wood charcoal, and it may be easily cut with a . At first sight it appears identified with charcoal, and for this reason been adduced to prove the vegetable nature of the mineral which con- it.

is substance very different from charcoal.—But although this substance so close a resemblance to charcoal, yet it will be found on experiment totally incombustible by any moderate heat. It appears to be com- d of particles either of silex or of alumine, cemented together, and de- g a fibrous aspect from the surface of which it bears the impression. ce, this argument cannot be relied on.

gument founded on the sources of carbon.—The vegetable origin of all ls of mineral coal has also been maintained on the ground that vegeta- is the only copious source of carbon in nature.

Carbon not exclusively a vegetable production.—It is, however, a fact esta- hed on good authority that bitumen and sulphur have been ejected from canoes located in primitive mountains. Bitumen is a combination of bon and hydrogen, and, as before stated, enters into the composition of principal body of coal. Hence it is evident that there is a source of bon independent of vegetable or animal life, situated at some depth from surface of the earth. To what extent this carbonaceous deposit exists the interior of our globe we cannot ascertain. It is sufficient for our pur- e that the smallest quantity is proved to have had such a source.

Carbon exists in primitive formations.—Besides, we know that plumbago carburet of iron, a compound of carbon with iron, and other minerals con- ing carbon, are found imbedded in the primitive formations, under cir- stances tending to show that they existed there prior to the creation of getable and animal life. We should also consider that carbonate of lime, ock formed in part of carbon, is one of the primary strata, and therefore a date antecedent to the existence of plants and animals. From these ts we learn that there are two sources of carbon; the one primary and iginal, and entirely independent of organic life; the other secondary, or ulting from the operation of the laws of vegetable and animal organization. e reader will therefore perceive at once that the argument in favor of the getable origin of coal founded on the source of carbon is not substantial.

Agency of vegetation admitted.—But it cannot be denied that plants have rnished one source of the upply of carbon requisite to form the extensive deposits of coal. The great profusion in which their relics occur in connexion with some beds of coal, prohibits any other view; admitting this, it is impossible to define the extent of vegetable agency in the formation of coal.

Regular gradation of the different varieties supposed to imply a uniformity of origin.—When the admission is once made that some coal is derived from a vegetable source, the fact presents itself that the different varieties pass into each other by insensible gradations, so as to render it impossible to establish a distinct line of demarcation between any two kinds. Whereas, if one portion were of vegetable derivation, and another were derived from a different source, such a line might be supposed to exist.

Argument founded on the gradation proves too much.—By extending this argument a little farther, graphite or plumbago is attributed to a vegetable source; for graphite and anthracite pass into each other by the same insensible gradations which take place between anthracite and the other varieties. Hence, if this argument proves any thing, it proves that graphite had a vegetable origin—a conclusion at variance with all geology.

Experiments of Maculloch. The experiments of Dr. Maculloch, an English geologist, are believed by some persons to be conclusive on the subject in question. These experiments consisted in heating wood coal under considerable pressure, allowing no escape to the gas. A substance precisely similar to common mineral coal was the product.

Some weight attaches to these experiments.—It must be admitted that the result of Maculloch's experiments favors the view of the vegetable origin. But they would not be conclusive unless anthracite coal could be thus artificially made. Even then we may reasonably inquire whether it is not possible for the same substance to be formed by different processes by nature and by art. This we know to be the case with graphite, the mineral just now spoken of, which is found in primary rocks, and is also occasionally met with in the chimnies of iron furnaces, where it has been artificially formed during the smelting of iron.

General conclusion on the whole subject.—In forming a conclusion on the subject of the origin of coal, I might borrow the title of a chapter in a well known work of Dr. Johnson—"The conclusion in which nothing is concluded." There are objections to every existing theory on this subject, and it is much easier to pull down former theories than to build new ones that shall be less objectionable. My opinion, however, is that the vegetation of the earlier ages of our globe has had some agency in the formation of coal; but that a considerable proportion of the body of this mineral beneath the earth's surface has originated from a source similar to that of most of the primary rocks. That is, the coal formation is in part an original mineral formation. One thing appears evident, that so much of the substance in question as may be referred to plants has undergone some peculiar process before assuming its present form. This process was such as to destroy the texture and essential character of the plants.

With this number I complete my essays on geology, having taken a cursory view of every important subject connected with it. It might be useful to give to my readers a brief history of the various theories on the formation of the earth which have been advanced at different times; and also to present to their view such a general train of inferences from the facts in our possession, as might be deemed the most rational and the most probable speculation on the formation of our globe. If I conclude on attempting to do this, I will soon add several numbers to this series of essays on geology.

S.

On the 30th of last month the thermometer stood at 5° above zero at Quebec. Snow has been so plentiful in the north and west that the members of the legislature travelled a considerable distance to the seat of government in their sleighs.

For the Advocate of Science.

AN INTRODUCTORY LECTURE ON CHEMISTRY.

(*Continued from page* 139.)

It is a common argument against the study of the elements of science, or the reading of scientific books, that the superficial information acquired by these means is soon lost from the memory, and serves no useful purpose. This argument is very convenient in the mouths of such persons as read nothing but romance, and is to be regarded, in general, as an apology for mental dissipation. And it is an argument of some weight with those who can derive no pleasure from the acquisition of knowledge, and whose reflecting faculties cannot be aroused without pain from their inglorious slumber. Are there any of this description now present? Let them cease to entertain a view so derogatory to human nature. What if the memory should not be capable of retaining all, or even a considerable part of the knowledge thus presented? Does so grievous a loss of your precious time rest heavily on your conscience? Are you not in the habit of spending a larger portion of time in pursuits acknowledged to be frivolous, or in slothful idleness? Does the exercise of the mind, the temporary activity of the faculties, pass for nothing? Consider that exercise braces the intellectual frame, invigorates the understanding and creates a habit of reflection; and consider that without use the high gifts of our nature remain undeveloped, and man becomes an animal instead of a rational being.

There is no department of scientific knowledge, the principles of which are so continually in operation before our eyes, as chemistry; and consequently the information gained on this subject is more likely to be impressed on the mind, and retained in the memory. Scarcely a minute of our life elapses that we do not witness a chemical experiment, performed either on the wide theatre of nature, or within the circumscribed range of human exertions. To the curious and reflecting mind these multiplied experiments are a source of endless recreation, and incessantly recal the beautiful laws of chemical action—laws and principles which operate as well in the smallest operation of domestic economy, as in the harmonious government of the universe.

But, to the great mass of mankind, these interesting and ever recurring phenomena are unseen, or if they force themselves into notice, strike the vision for an instant and are fled. They awaken no idea, they elicit no thought, no exercise of intelligence. A vacant and unmeaning gaze is all they can excite.

In representing the phenomena of chemistry to be perpetually offering themselves to our regard, I have not exaggerated. The combustion of the fire, or of the candle, is a chemical process, which admits of a simple and interesting explanation, unknown to the thousands who are every day kindling fires or lighting candles. The cook, in performing her domestic duties, becomes a practical chemist, but alike ignorant of what she does as those for whom she provides the banquet. In preparing a cup of tea, the boiling of the water is a chemical process, as well as the dissolving of the sugar. The fragrant fumes arising from the surface of the beverage are the result of chemical laws. So is the peculiar action of sour cream in becoming curdled, and also the prejudicial effect of boiling instead of infusing the herb. The leavening of bread by yeast, the production of acidity when the fermentation is suffered to proceed too far, and the effect of potash and soda in destroying the acidity, are important chemical experiments. The dairy is almost a chemical laboratory—the churning of butter, the making of cheese, the curdling of milk with rennet, the souring of milk and the formation of *bonny-clabber*, all involving the principles of the science. Of the same character are the union of fat with the ley of ashes to form
the fermenting of cider to form vinegar, and the preservin
tion of salt and vinegar on meat and pickles. The effect o
juices of fruit in corroding metals, that of eggs in coloring glas
silver, and of mustard in coloring the latter substance, can onl
accounted for on chemical principles. But enough has been
to convince my hearers that, although an acquaintance with
mistry may not be an essential qualification of a good c
there is an intimate relation between the processes of cookery
the principles of that science.

Perhaps it would have been better had I given you in the e
part of this lecture some definite idea of the meaning conveye
the term chemistry. Various definitions have been adopted by
ferent authors, more easily comprehended by one who needs no
information, than by those who are ignorant of the subject.
science of chemistry refers to the changes which take place in
constitution of matter—the changes in the essential and pec
particles of which matter is composed. If I grind a lump of s
to powder, it is evident that I have effected no change on its p
cles; they are still solid particles of sugar. But if I dissolve
sugar in water, it is then equally plain that I have made a ch
in its component particles, and consequently that the solution
the sugar is a chemical process, whereas its pulverization was pu
mechanical. Now a lump of chalk treated in the same way un
goes no change; it mixes with the water and subsides again w
suffered to rest, but still remains simply powdered chalk, beca
water has no chemical action on chalk. But if I pour some acid
the chalk, as sulphuric acid or oil of vitriol, the particles of
chalk unite rapidly with those of the acid, so as to produce a viol
effervescence. That action of course is chemical.

When different substances are thus brought into chemical uni
the result is a compound which often retains no single property
either of its ingredients. Two poisons by being mingled may t
produce a combination perfectly innocent; and on the other ha
two harmless substances are sometimes capable of forming an
tense poison. Frequently, different proportions of the same ing
dients constitute different substances, one of which is inert or in
cent, and the other highly poisonous. The gas which sparkles
the champaigne, or in seltzer water, grateful and gently stimul
ing to the stomach, is instantly fatal when taken into the lungs.
is composed of carbon and oxygen, the former of which is the ba
of our food, and the latter the vital principle of the air we breat
The atmosphere is composed of oxygen and nitrogen, either
which alone would destroy life. Gum arabic, when tested by c
mical agents, is found to contain the identical elements, which
another form of combination, compose the deadly poison of the rat
snake. Arsenic, in its metallic state, has no more ill effect
the human body than so much earth or saw dust; but when combi
with the life-giving principle of air, is one of the most viol
of poisons. Quicksilver is equally inert alone, but forms corros
sublimate, a well known destructive agent, when united with o
of the elements of common salt. Brandy and lamp oil are simil
in composition, and the precious diamond contains nothing th
does not exist in charcoal.

It is the province of chemistry to ascertain the composition of
substances, and the affinities of their elements one for anoth
Two modes are adopted to accomplish this object, analysis and sy
thesis. By analysis is meant the separation of bodies into their e
ments. Synthesis implies the reverse operation, or the combini
of the elements in order to form the compound body. As there

bstances in nature in a simple state, or unmixed chemically other substances, it follows that the chemist is under the con- necessity of performing experiments. By these experiments, mingle amusement with instruction, the attention of the r is fastened on the study. The contemplated course of lec- will embrace many handsome experiments. For, although I t disposed to be satisfied with addressing solely the eyes of arers, yet a principle or fact is always more firmly impressed memory when some visible illustration can be brought to pon it.

ctricity and galvanism form a part of chemistry. To these also call the attention of my class. The former is replete harms to every one who can contemplate with satisfaction the nena of the natural world. Besides its sensible connexion hunder storms and the aurora borealis, electricity is closely rned in the formation of clouds and of rain, in the precipita- f dew, and in most atmospheric operations.

vanism appears to be a modification of the electric fluid, more in its action, but capable of exhibiting the most striking ef- On the muscular system of dead animals, its operation is ex- y curious, calling into active motion every portion of the ani- rame. When applied to a person recently dead, the effect produce the appearances of life, throwing all the limbs into ment, and distorting the features in a hideous manner. It is ed by some chemists, that if applied to the bodies of crimi- hortly after execution, it may be capable frequently of restor- e.

ISTORICAL EULOGY ON THE MARQUIS DE LAPLACE,

d at a public session of the Royal Academy of Sciences, June 15, 1829, by Baron Fourier.*

Translated for and extracted from Silliman's Journal.

name of LAPLACE has resounded in all parts of the world the sciences are honored. His memory, however, can- ceive a more worthy homage than the unanimous tribute admiration and the tears of the illustrious body whose and glory he has shared. He consecrated his life to the of the greatest objects which can occupy the human mind. wonders of the heavens, the lofty questions of natural ophy, the ingenious and profound combinations of mathe- l analysis, all the laws of the universe, were presented to oughts for more than sixty years, and his efforts crowned mortal discoveries.

as remarked, from his earliest studies, that he was en- with a prodigious memory; all the occupations of the were easy to him. He rapidly acquired a sufficiently ex- acquaintance with the ancient languages, and also culti- different branches of literature. Every thing interested ng genius, every thing could unfold it. His first success theological studies; he treated with talent, and with an dinary sagacity, the most difficult points of controversy. are ignorant by what happy deviation Laplace passed cholastic to high geometry. This last science, which y admits of any division, attracted and fixed his attention. hat, he abandoned himself, without reserve, to the im- f his genius, and felt keenly that a residence in the capi- become necessary. D'Alembert then enjoyed all the his fame. He it was, who had just informed the court n that the Royal Academy possessed a geometer of the der, Lagrange; ONE, who, without this noble suffrage, have remained a long time unknown. D'Alembert had ced to the king of Prussia, that a single man in Europe could replace, at Berlin the illustrious Euler, who had consented to return to St. Petersburg at the instance of the Russian government. I find, in the unpublished letters in the possession of the Institute of France, the details of this glorious negociation, which fixed the residence of Lagrange at Berlin.

About the same time Laplace commenced that long career which he was soon to render illustrious.

He presented himself at the house of D'Alembert, preceded by numerous recommendations which one would have thought very weighty. But his attempts were useless: he was not even introduced. It was then that he addressed to him, whose suffrage he had just solicited, a very remarkable letter on the general principles of mechanics, and of which M. Laplace has many times recited to me different fragments. It was impossible that a geometer so great as D'Alembert should not be struck with the singular depth of this writing. The same day he called on the author of the letter, and said to him; (these are his own words,) "*Monsieur, vous voyez que je fais assez peu de cas des recommendations: vous n'en aviez pas besoin. Vous vous etes fait mieux connaitre; cela me suffit; mon appui vous est du.*"* He obtained, a few days after, that Laplace should be nominated Professor of Mathematics at the Military School of Paris. From this moment, devoted entirely to the science which he had chosen, Laplace gave to all his works a fixed direction, from which he never deviated; for the unchangeable firmness of his views has been always the principal trait of his genius. He had already touched the known limits of mathematical analysis; he had already mastered what the science then possessed of the most ingenious and of the most powerful. No person was more capable than himself of enlarging its domains. He had solved a very high question of theoretical astronomy. He formed the plan of consecrating his efforts to this sublime science; he was destined to finish it, and was able to embrace it in its full extent. He meditated deeply on his glorious design; and he spent all his life to accomplish it, with a perseverance of which the history of science can offer no other example.

The immensity of the subject flattered the just pride of his genius. He undertook to compose the *almageste* of his age; this monument which he has left to us under the name of the *Mecanique Celeste:* and his immortal work carries it as far beyond that of Ptolemy, as the analytical science of the moderns surpasses the elements of Euclid.

Time, which alone dispenses, with justice, literary glory; which consigns to oblivion all contemporary mediocrity, perpetuates the remembrance of great works. These, only, carry to posterity the character of each age. Thus the name of Laplace will live in all ages. But, and I hasten to say it, enlightened and faithful history will never separate his memory from that of the other successors of Newton. She will unite the illustrious names of D'Alembert, of Clairaut, of Euler, of Lagrange, and of Laplace. I limit myself merely to cite here the great geometers whom the sciences have lost, and whose researches have had their common object the perfection of physical astronomy.

* * * * * *

Since Euler, Lagrange has contributed the most to found the mathematical analysis. It has become in the writings of these wo great geometers, a distinct science, and the only one of mathematical theories of which we can say that it is completely and rigorously demonstrated. Alone, among all these theories, is it satisfied by itself—it enlightens all others, and is so necessary to them, that, deprived of its aid, they can remain but imperfect,

Lagrange was born to invent and to enlarge all the sciences of calculation. In whatever condition fortune had placed him,

gentleman, our readers are probably well aware, has been dead for some e himself possessed no ordinary scientific talents.—*Ed.*

* Sir, you perceive that I care little for recommendations; you had no need of them. You have introduced yourself in a better way; that is sufficient; I owe you my support

whether peasant or prince, he would have been a great geometer: he would have become so necessarily and without any effort—a thing which we cannot say of all those, even among the first ranks, who have excelled in this science.

If Lagrange had been contemporary with Archimedes and with Conon, he would have shared the glory of the most memorable discoveries. At Alexandria, he would have been the rival of Diophantus.

The distinctive trait of his genius consists in the unity and in the greatness of his views. In every thing he confined himself to a simple, just and very elevated thought. His principal work, the *Mecanique Analytique*, can be denominated the *Mecanique Philosophique*; for he brought back all the laws of equilibrium and of motion to a single principle: and that which is not less admirable, he submitted them to a single method of calculation of which he himself was the inventor. All his mathematical compositions are remarkable for a striking elegance, for the symmetry of the forms, and the generality of the methods, and if we can speak thus, for the perfection of the analytical style.

Lagrange was no less a philosopher than a great geometer. The whole course of his life proved the truth of the assertion—by the moderation of his desires, by his immutable attachment to the general interests of humanity, by the noble simplicity of his customs, and by the elevation of his character; in fine, by the justness and depth of his scientific works.

(*To be continued.*)

THE ADVOCATE OF SCIENCE.

TWelfth Month 5, 1833.

TO CORRESPONDENTS.

A communication has been received from X. Y. Z. on the subject of the moon *not* having to traverse a resisting medium. We had already an article written and in type on this subject, which had been crowded out of our last number; and as the two pieces do not materially differ from each other in substance, our correspondent will certainly concur with us in opinion that it is unnecessary to publish both of them. We hope he will favor us with other communications.

Our readers will perceive another article from "*Practical Machinist.*" In speaking of high pressure engines, it was our impression that he alluded altogether to steam boats of this class; hence we mentioned our doubts of these existing all over the United States, having seen none from New York to Baltimore.

We pay all the deference possible to "D. A. W." He, or she, whichever sex the writer claims, must certainly know our paper is not a receptacle for that species of writing, which, without any claims to literary merit, is unfortunately recognized by too many of our journals as *literary productions.* The word literature has a specific meaning. We doubt whether Johnson, Steele, or Addison, or any other of our standard authors, would feel complimented with the title of literary characters, could they be here to observe the indiscriminate application of the term. Every romantic upstart who can scribble love tales, and with the aid of a dictionary stick together words which will rhyme, though insensible as stupidity itself, claims it for his palm; and it is almost as much as an unpretending character dare do to dispute that claim. Hence, the multitude of petulent authors, and the eternal annunciation of new original tales and poems and novels and domestic manners and travels which are to be seen on every side. We have no objections to publish every thing in our paper which bears the impress of common sense. Essays on the rise and progress of literature, the manners and customs of nations, and every thing that is the product of thought, we are always glad to receive: but preserve us from those ephemeral productions, which tend to overthrow the foundation of all thought. In conclusion, with the utmost deference, we would ask our correspondent "D. A. W." and as many more like him as occasion requires,

"Can it be worth thy wondrous waste of pains,
To publish to the world thy lack of brains?"

An interesting anecdote of natural history has been dropped in our box, with the signature of "A." We have frequently solicited such from our friends, and they will always be favorably received. We publish them, however, without the authors give us their names. We are always responsible for the truth or authority of what they publish when they can give neither, their character for veracity may be fairly tioned.

We have the pleasure to announce the publication of the fourth of T. A. Conrad's "Fossil Shells of the Tertiary Formation of North rica," embracing descriptions of seventy eight species from the strata Claiborne, Alabama, making, in addition to those of a former numb less than 118 species which have been described and published by t defatigable naturalist during his sojourn in Alabama.

We regret that the plates of this number, like those of the former are necessarily postponed until the author's return, which will be e the spring, when he designs embodying his work in a single volume ample illustrations.

THE MOON HAVING TO TRAVERSE A RESISTING MEDI

Our correspondent L. H. P. maintained that the moon traverses a ing medium, as is proved by the observations of astronomers who h covered that she has been for centuries approaching our globe. W pressed our dissent from that conclusion, and now furnish our reason

The older astronomers, together with the immortal Newton, demon that the moon revolves round our earth in a shorter period than s merly did, and that the lunar month, which is the period of this revo still continues to grow shorter every year. The inference from this legitimate, that the moon is steadily approaching the earth, and w course of time, *if this approximation continue*, fall upon our planet. is a limit, however, to this approximation.

The regularity of the motions of the moon is more or less affected relative position to the other bodies of the solar system. At one per relative position is such as to accelerate her motion round the earth sooner or later, that position is so changed as to have the contrary e retarding her motion during a certain period of years; and at the that period, she regains her original place and velocity, and enters into the influence of the same causes for the same term of years. A lysis of these causes demonstrates several distinct and calculable irre ties, each of which has its particular period to accomplish, at the te tion of which the moon is in the same place, with regard to the influ that particular cause, as at the commencement of such period. Ea of these irregularities, therefore, has its revolution to accomplish; an revolution has its particular term of years, varying from a single y many thousands.

We have not time at present to enter into this subject so as to ren intelligible to such of our readers as have no knowledge of astronom intend to do so in an early number. Meanwhile, we will merely sta the approximation of the moon to the earth, which was perceived a culated by Newton and others, has since been demonstrated by La Pla pend on one of these revolutions or *cycles*, which, after many thousand will impart an opposite influence so as to counteract the effect th duced.

The idea that the motion of the moon is impeded by the earth's phere, we do not believe to be tenable. In the first place, *every acce and retardation of the moon's motion has been observed by astronomers true cause demonstrated.* The result of their calculations has prov principles correct on which they are founded. Therefore, no other c in operation.

We may also argue that the moon meets with no such resistance the known laws of matter. At the height of 43 or 44 miles, the atmo is not sufficiently dense to exert an appreciable influence in refracting As the density diminishes in a geometrical ratio, we should proba have to ascend many hundred miles before we should find that the tion of gravitation overcomes its elasticity; or, before its elasticity an its farthest limit. Here, of course, the atmosphere will cease to ex

It is said that a lady in New York city, died in consequence of seeing the late exhibition of meteors. She swooned, and recovering, expressed her conviction that a dissolution of the world was at hand. With the awful terror this excited, she was attacked with another paroxysm, under the influence of which she expired. We state this as a solemn evidence of the influence of superstition over the human mind. In an age when the progress of science is altogether unexampled, and its truths so accessible to every person, we must confess our surprise that terror should be excited at exhibitions of so grand a feature, which display alike the wonders of the natural world, and the power of a Supreme cause. Yet we regret to say, this example of superstition is not an isolated case. Advantage has been taken of it by the fanatics of religion to terrify the weak and credulous. We have seen two publications, and have heard of more, which say it is a solemn evidence of approaching chaos, in which all animated creation must become extinct; and they call upon the world to prepare for that "dreadful day!" Perhaps we would not go far from the mark, were we to call this open profanity.

DR. GODMAN'S RAMBLES OF A NATURALIST.

(*Continued from page* 134.)

The fleet running crab (Cypoda *pugilator*,) mentioned as living in burrows dug in a moist soil, and preying chiefly on the sugar cane, is justly regarded as one of the most noxious pests that can infest a plantation. Their burrows extend to a great depth, and run in various directions; they are also, like those of our fiddlers, nearly full of muddy water, so that, when these marauders once plump into their dens, they may be considered as entirely beyond pursuit. Their numbers are so great, and they multiply in such numbers, as in some seasons to destroy a large proportion of a sugar crop, and sometimes their ravages, combined with those of the rats and other plunderers, are absolutely ruinous to the sea side planters. I was shown by the superintendent of a place thus infested, a great quantity of cane utterly killed by these creatures, which cut it off in a peculiar manner, in order to suck the juice; and he assured me that, during that season, the crop would be two thirds less than its average, solely owing to the inroads of the crabs, and rats, which, if possible, are still more numerous. It was to me an irresistible source of amusement to observe the air of spite and vexation with which he spoke of the crabs; the rats he could shoot, poison, or drive off for a time with dogs. But the crabs would not eat his poison, while sugar cane was growing; the dogs could only chase them into their holes; and if, in helpless irritation, he sometimes fired his gun at a cluster of them, the shot only rattled over their shells like hail against a window. It is truly desirable that some summary mode of lessening their number could be devised, and it is probable that this will be best effected by poison, as it may be possible to obtain a bait sufficiently attractive to ensnare them. Species of this genus are found in various parts of our country, more especially towards the south. About Cape May, our friends may have excellent opportunities of testing the truth of what is said of their swiftness and vigilance.

The violet crab, (Gecarcinus *ruricola*,) which we promised to notice more particularly at the commencement of this section, has been the subject of many improbable stories. Its habits are exceedingly interesting. They mostly inhabit intertropical countries, and live in holes on the sides of mountains, in clefts of rocks, hollow stumps of trees, and in cemeteries. Once a year, in the month of April or May, they collect in immense bands, forming a caravan of millions, and march down to the sea to cast their spawn. Like the Norway rat, they permit nothing to interrupt their direct course, save the face of the country, to which they must conform: if intersected with rivers, they are to be seen winding along the course of the stream. After depositing their ova, they return much enfeebled. It is said about two thirds of their eggs are immediately devoured by shoals of hungry fish. They seal up the mouth of their burrow when the process of casting their shells is going on; after this they are much sought for as an article of food, though sometimes poisonous; a quality attributed to the manchineel, which they are supposed, perhaps falsely, to have eaten. It is the same as the crab below described.

The land crab, which is common to many of the West India islands, is more generally known as the Jamaica crab, because it has been most frequently described from observation in that island. Wherever found, they all have the habit of living, during great part of the year, in the highlands, where they pass the day time, concealed in huts, cavities, and under stones, and come out at night for their food. They are remarkable for collecting in vast bodies, and marching annually to the sea side, in order to deposit their eggs in the sand; and this accomplished, they return to their former abodes, if undisturbed. They commence their march in the night, and move in the most direct line towards the destined point. So obstinately do they pursue this route, that they will not turn out of it for any obstacle that can possibly be surmounted. During the day time they skulk and lie hid as closely as possible, but thousands upon thousands of them are taken for the use of the table by whites and blacks, as on their seaward march they are very fat and of fine flavor. On the homeward journey, those that have escaped capture are weak, exhausted and unfit for use. Before dismissing the crabs, I must mention one which was a source of much annoyance to me at first, and of considerable interest afterwards, from the observation of its habits. At that time I resided in a house delightfully situated about two hundred yards from the sea, fronting the setting sun, having in clear weather the lofty mountains of Porto Rico, distant about eighty miles, in view. Like most of the houses in the island, ours had seen better days, as was evident from various breaks in the floors, angles rotted off the doors, sunken sills, and other indications of decay. Our sleeping room, which was on the lower floor, was especially in this condition; but as the weather was delightfully warm, a few cracks and openings, though rather large, did not threaten much inconvenience. Our bed was provided with that indispensable accompaniment, a musquito bar or curtain, to which we were indebted for escape from various annoyances. Scarcely had we extinguished the light, and composed ourselves to rest, than we heard, in various parts of the room, the most startling noises. It appeared as if numerous hard and heavy bodies were trailed along the floor; then they sounded as if climbing up by the chairs and other furniture, and frequently something like a large stone would tumble down from such elevations with a loud noise, followed by a peculiar chirping note. What an effect this produced upon entirely inexperienced strangers, may well be imagined by those who have been suddenly awaked up in the dark, by some unaccountable noise in the room. Finally, these invaders began to ascend the bed; but happily the musquito bar was securely tucked under the bed all around, and they were denied access, though their efforts and tumbles to the floor produced no very comfortable reflections. Towords daylight they began to retire, and in the morning no trace of any such visitants could be perceived. On mentioning our troubles, we were told that this nocturnal disturber was only Bernard the Hermit, called the soldier crab, perhaps from the peculiar habit he has of protecting his body by thrusting it into an empty shell, which he afterwards carries about, until he outgrows it, when it is relinquished for a larger.

Not choosing to pass another night quite so noisily, due care was taken to exclude Monsieur Bernard, whose knockings were thenceforward confined to the outside of the house. I bated a large wire rat trap with some corn meal, and placed it outside of the back door, and in the morning, found it literally half filled with these crabs, from the largest sized shell that could enter the trap, down to such as were not larger than a hickory nut. Here was a fine collection made at once, affording a very considerable variety in the size and age of the specimens, and the different shells into which they introduced themselves.

The soldier, or hermit crab, when withdrawn from his adopted shell, presents about the head and claws a considerable family resemblance to the lobster. The claws, however, are very short and broad,and the body covered with hard shell only in that part which is liable to be exposed or protuded. The posterior or abdominal part of the body, is covered only by a tough skin, and tapers towards a small extremity, furnished with a sort of hooklike apparatus, enabling it to hold on to its factitious dwelling. Along the surface of its abdomen, as well as on the back, there are small projections, apparently intended for the same purpose. When once fairly in possession of a shell, it would be quite a difficult matter to pull the crab out, though a very little heat applied to the shell will quickly induce him to leave it. The shells they select are taken solely with reference to their suitableness, and hence you may catch a considerable number of the same species, each of which is in a different species or genus of shell. The shells commonly used by them, when of larger size, are those of the whilk, which are much used as an article of food by the islanders, or the smaller conch [strombus] shells. The very young hermit crabs are seen in almost every variety of small shell found on the shores of the Antilles. I have frequently been amused by seeing ladies, eagerly engaged in making a collection of these beautiful little shells, and not dreaming of their being tenanted by a living animal, suddenly startled, on displaying their acquisitions, at observing them to be actively endeavoring to escape; or on introducing the hand into the reticule to produce a fine specimen, to receive a smart pinch from the claws of the little hermit. The instant the shell is closely approached or touched, they withdraw as deeply into the shell as possible and the small ones readily escape observation, but they soon become impatient of their captivity, and try to make off. The species of this genus (pagurus) are very numerous, and during the first part of their lives are all aquatic. That is, they are hatched in the little pools about the margin of the sea, and remain there until those that are destined to live on land are stout enough to commence their travels. The hermit crabs which are altogeter aquatic are by no means so careful to choose the lightest and thinnest shells, as the land troops. The aquatic soldiers may be seen towing along shells of most disproportionate size; but their relatives, who travel over the hills by moonlight know that all unnecessary incumbrance of weight

should be avoided. They are as pugnacious and spiteful as any of the crustaceous class; and when taken, or when they fall and jar themselves, considerably, utter a chirping noise, which is evidently an angry expression.

They are ever ready to bite with their claws, and the pinch of the larger individuals is quite painful. It is said, that when they are changing their shells, for the sake of obtaining more commodious coverings, they frequently fight for possession, which may be true where two that have forsaken their old shells meet, or happen to make choice of the same vacant one. It is also said, that one crab is sometimes forced to give up the shell he is in, should a stronger chance to desire it. This, as I never saw it, I must continue to doubt; for I cannot imagine how the stronger could possibly accomplish his purpose, seeing that the occupant has nothing to do but keep close quarters. The invader would have no chance of seizing him to pull him out, nor could he do him any injury by biting upon the surface of his hard claws, the only part that would be exposed. If it be true that one can dispossess the other it must be by some contrivance of which we are still ignorant. These soldier crabs feed on a great variety of substances, scarcely refusing any thing that is edible; like the family they belonged to, they have a decided partaility for putrid meats, and the planters accuse them also of too great a fondness for the sugar cane. Their excursions are altogether nocturnal; in the day time they lie concealed very effectually in small holes, among stones, or any kind of rubbish and are rarely taken notice of, even where hundreds are within a short distance of each other. The larger soldier crabs are sometimes eaten by the blacks, but they are not much sought after even by them, as they are generally regarded with aversion and prejudice. There is no reason, that we are aware of why they should not be as good as many other crabs, but they certainly are not equally esteemed.

For the Advocate of Science.

ON METEORS, OR SHOOTING STARS.

In the last number of the Advocate of Science, I gave a description of the extraordinary and splendid meteoric exhibition which recently occurred in the United States. I have since met with an account of the same phenomenon as observed at New Haven, Conn. by Professor Olmstead, which is more precise than any other that I have seen, with regard to the meteoric pole. In that description, the pole was observed to move from east to west, following the course of the stars in their revolution. I did not observe this, owing to the lateness of the hour when my attention was called to the phenomenon. I am induced, however, by one circumstance, to believe that the change of place in the pole was not a constant motion; for, of all those persons who observed the appearance earlier than myself, no one noticed that the meteors did not proceed in a line from the zenith, although their observations extended through a period of four hours; that is, from two to six o'clock. Had the motion of the pole coincided with that of the heavens, its place must have been not much above the eastern horizon; a circumstance that could not have escaped the notice of many. The situation of the pole relative to the fixed stars, as observed by Professor Olmstead, accords precisely with my observations at Wilmington.

The reasoning of Professor Bache, as given in the last number of the Advocate, applies only to a limited extent to the case in point. If the situation of the meteoric pole were deduced from the direction of those meteors which made their appearance at a considerable distance from that pole, then their height could not be fairly inferred from the observations made at distant places. But when the precise point, or, as in the present case, a very small space in the heavens, is indicated by the appearance of meteors emanating immediately from that point or space, there can be no deception, and the observations made at several places must determine the height. With reference to the meteors of the 13th ult. their height must be acknowledged to have been very great, though not definitely ascertained.

I will now proceed to offer some remarks on the nature and causes of meteors, premising a brief description of them.

The term meteor is derived from a Greek word, μετεωρος, signifying high, or lofty. It is properly applied to any transient, luminous appearance in the atmosphere; such as lightning, the aurora borealis, shooting stars, the ignis fatuus, &c. Of these, lightning is known to be electric, and the aurora borealis is almost universally believed to be so. The ignis fatuus, or Jack-o-lantern, is proved to arise from the combustion of certain gaseous exhalations. Shooting or falling stars, to which the term meteor is most familiarly applied, are attributed to various sources; and their true cause yet remains buried in obscurity. To this form of meteor my attention will be principally directed, and to this form exclusively I wish to be understood as applying the term meteor, unless otherwise expressed.

Every evening, when the sky is unclouded, numbers of meteors, apparently small and very distant, may be seen shooting through the heavens, in every direction. The greater number descend in their course toward the horizon, some in perpendicular lines, others very obliquely. A few may be observed to move in a horizontal or an ascending course. A faint streak of light is mostly perceptible for a short time, marking their path. This is the most common form of meteor, with the appearance of which every child is familiar. Judging from my personal observations, I am satisfied that the number of them visible in the entire circle of the sky, under favorable circumstances, often averages one for every minute during the night. As there can be no doubt that they occur during the day, when, however, they are eclipsed by the solar light, we may safely estimate the number of these meteors, which course through our firmament in twenty-four hours, to amount to between one and two thousand.

The general appearance of these meteors is small and remote, yet occasionally we observe them assuming an aspect more brilliant and more formidable. The apparent magnitude of the largest is greater than that of the moon, and they sometimes move through an arc of the heavens, embracing nearly half the horizon. One of the many large meteors of this kind was observed in England on the 18th of August, 1783. It was described by the late celebrated astronomer Cavallo, who, together with some intelligent friends, saw it from the terrace of Windsor Castle. It was visible for half a minute, and then burst into pieces and vanished. Several minutes afterwards, a distant rumbling noise was perceived. Under the presumption that the noise in this case was caused by the explosion of the meteor, its height was computed to be between fifty and sixty miles. The course pursued by it was nearly horizontal, and it must have traversed, in the short space of half a minute, the astonishing distance of 1000 miles; for it was not only seen in the north of Scotland, but also at Brussels, at Paris, and at Rome, on the continent.

The real magnitude of this description of meteors is always very considerable. The celebrated American astronomer, Rittenhouse, calculated the diameter of one which was seen at Philadelphia in 1799, at half a mile.

Their height from the earth's surface, when they first become visible, may be considered to be about the same as the height of the one described by Cavallo. Most probably they are as a general rule always between thirty and seventy or eighty miles distant from the earth when they are first seen.

They appear to observe some relation to the weather, or the state of our atmosphere. When they are observed, it is generally clear and calm, and sometimes they are succeeded by a violent wind. They are not exclusively seen at night, but several have been distinctly perceived during the day. The course of the wind does not seem to have much, if any, sensible influence on their motion.

With regard to their termination, most of them explode, bursting into several fragments before they entirely disappear. This explosion is followed by a report, or a rumbling noise like thunder. A cloud of smoke has been perceived in some instances to indicate the place of their explosion. A smell of sulphur has been occasionally perceptible after their disappearance.

I will now trace the connexion between these meteors and the stones which have at different times fallen in different countries. That stones, and indeed showers of stones, have repeatedly fallen from the atmosphere, there is too much evidence to allow of a moment's doubt. We are assured by Cardan, an Italian writer, that a shower of more than 1000 stones fell in Italy, near the close of the last century, the largest of which weighed 120 pounds; and their fall was accompanied with a great light in the air. As Italy is a volcanic country, it is not improbable, if we admit the truth of this account, that these stones were ejected from some of the volcanoes in that quarter of the world. About the year 1725 a fire ball burst in Northamptonshire, England, and made two deep holes in the soil, which consisted of gravel. These holes were found to be a yard deep, and two stones were found at their bottom, which were together about as large as a man's head. An iron ball was shot from a cannon perpendicularly into the ground, in order to ascertain the comparative force with which the stones had been driven; and the impression of the ball was not greater than that produced by the falling stones. At the moment of the occurrence of the phenomenon, a man was standing close to the spot, and was instantly killed. His body was much bruised.

Not many years ago, a well authenticated account was published of a meteoric

stone which fell in France. The inhabitants of the immediate neighborhood were greatly alarmed by a whistling noise, resembling that of a falling body, and they took shelter in the house, when the sound of the fall of a heavy body was distinctly heard, apparently proceeding from an adjoining vineyard. Search being made, a hole newly formed was at length found in the soil, about thirty paces from the house, and a stone dug from it weighing upwards of seven pounds.

In 1798, a meteor in the form of a luminous globe was seen moving from west to east, over the southern part of France, and it fell in the sight of several individuals. The noise caused by it was such as to terrify the villagers in the neighborhood; and one man, who lived near the spot where it fell, was so much alarmed that he hid himself in his house, and would not look out till next morning. On examining the neighboring fields, a black stone was found buried beneath the surface, weighing twenty pounds.

In 1802, another meteor of the same kind was observed near the city of Alencon, France, the account of which is given by the distinguished French astronomer Biot. The explosion was heard for a distance of nearly 100 miles in every direction from the spot where it occurred. Above two or three thousand stones fell to the ground, the largest of which weighed seventeen pounds. This circumstance took place about one o'clock in the afternoon.

But the most precise and best authenticated account of this kind on record, refers to a phenomenon which took place in Connecticut in December, 1807. About day light, a globe of fire appeared above the northern horizon and moved towards the zenith till it reached within 15° of that point. Its course was not direct, but forming an undulating line. The apparent size of this body was more than half that of the full moon. It was visible about half a minute, and disappeared gradually without any visible explosion, though three loud and distinct reports were perceived in thirty or forty seconds afterwards. These reports were immediately followed by a rumbling noise like thunder. A number of masses of stone fell at the same time in the township of Weston, some of them nine miles distant from others, in a line with the track of the meteor. Professor Silliman, of New Haven in company with another scientific gentleman, spent several days in making an investigation of the circumstances connected with the fall of these stones. They discovered, as they supposed, three different showers to have taken place, corresponding with the three explosions. Some of the fragments were picked up before they had grown cold. In one place the cattle were so much alarmed at the noise and concussion produced as to leap their enclosure for safety. Several masses were collected, weighing from twenty to fifty pounds, and other masses which had been much larger were found crumbled into small pieces.

From the statement which I have now given there can be no doubt of the fact that stones have repeatedly fallen from the atmosphere in connexion with the fire balls, or that description of meteors before referred to. An analysis of the stones taken together with their general external aspect, which is very peculiar, has demonstrated that a large number of detached metallic stones, scattered over the surface of the earth have had the same origin.

Of these some are of immense magnitude. Professor Pallas discovered one in Siberia weighing 1600 pounds. In Mexico, one was discovered by a celebrated German mineralogist, weighing more than 2000 pounds. Humboldt describes an enormous mass of meteoric stone, also in Mexico, the weight of which was not less than 4000 pounds.

The composition of meteorites, as the stones supposed or known to have fallen from meteors are termed, is always uniform, and differs from that of every other substance on the earth. A large proportion of their mass is iron, but they contain besides, magnesia, silex, sulphur, and a peculiar metal called nickel. For a more minute account of their composition, and for other valuable information concerning meteors, I must be content to refer the reader to an article published several months ago, in the Advocate of Science, in reply to a query respecting shooting stars. Having made these preliminary remarks which are essential to the further consideration of the subject, I will, in another number, investigate the theories of meteors and attempt an explanation of their causes. H. G.

For the Advocate of Science.

The editor of the Advocate of Science doubts the correctness of my assertion that "there are high pressure engines all over the United States, working at from 60 to 150 pounds to the square inch," and grounds the validity of his doubts upon the fact of having travelled from Baltimore to New York without observing any of that description. I do not wish to be uncourteous, and would regret very much that any thing I say should be construed into a sneer, but will merely state that there is at least one such in the city of which the editor is a native—there are many such in Baltimore, Philadelphia and New York, and some of them frequently use steam as high as 175 pounds to the inch, without fear of an explosion.

In my former communication, for *line*, read *lever*, of the safety valve.

PRACTICAL MACHINIST.

For the Advocate of Science.

ANSWERS TO BARBARA.

"1. Why does the wind incline to follow the course of the sun; that is, why does it change from north to south by east, more frequently than by west?"

Answer.—When a northerly wind has existed, a westerly and southerly current commonly forms in the elevated regions of the atmosphere, to counteract which an opposite current is formed beneath. This is an easterly wind. For the same cause to which the sea breeze is owing, this wind tends to the south about mid day, and falls in with the upper current. A rarified state of atmosphere is the consequence, and this brings on a wind from the interior hilly country, the direction of which is at first from west, and finally from north west or north. The same causes now operate again, and the same series of changes is kept up.

"2. The days are now (November) as short and the sun as powerless as on the first of February. Why is it so much warmer now than at the same period after the winter solstice?"

Answer.—Because our climate still feels the influence of the heat of the past summer. It is well known that the hottest period of summer is some time after the summer solstice, because the warming power of the solar heat requires a considerable time to penetrate the soil, and to extend itself to the northern forests. A parallel case is that of the tides, which do not arrive at their height till after the moon has crossed the meridian.

"3. Why is a north west wind so dry and cloudless, while a south west wind, which blows over land like the former, is damp and apt to produce rain?"

Answer.—A northerly wind increases the density of the atmosphere, and consequently its capacity to retain water in an invisible form, by which the formation of clouds is prevented. On the other hand, a southerly wind rarefies the air, and has just the opposite effect. When the warm southerly current mingles with the cold atmosphere from the north, a condensation of vapor in the form of cloud is the necessary consequence.

"4. Why is a south west wind more apt to bring clouds and rain in winter than in summer; or is it so?"

Answer.—It is certainly so, for the following reasons. In summer, the difference of temperature between the southerly and northerly currents is not so great as in winter, and of course there is not so great a tendency to the production of cloud when they mingle together. Besides, the general disposition of the air to the formation of clouds, is less in summer than in the winter.

"5. What is the cause of the mild weather in November commonly called Indian summer?"

Answer.—I suppose the temperature of the air, in general, is more equalized at this period, than in almost any other portion of the year. The intense heat of summer is past, and the causes of cold do not yet act with much energy. Indian summer is therefore a kind of truce between summer or autumn and winter.

BOREAS.

For the Advocate of Science.

One of your subscribers wishes to be informed why it is sometimes too cold for snow.

S. L.

JOURNAL OF THE WEATHER

For 11th Month, November, 1833, kept at Wilmington, Del.

d.	☾ THERM.	BAROMETER.	WINDS.			RAIN	OBSERVATIONS.
1	27 43 40	30.20 30.08 29.92	E	1	S.W	1	Clear—hazy.
2	39 62 48	29.87 29.85 .83	N.E	1	N.W	1	Clear—hazy.
3	44 52 39	.97 .97 30.20	N.E	1	N.E	1	Cloudy–little snow–clear.
4	31 38 28	30.15 30.12 .20	E	1	N	1	Clear.
5	23 37 30	.29 .29 .30	S.W	1	N.W	1	Clear–cloudy–little rain.
6	29 42 41	.14 .12 29.99	N.W.	1	E	1	Partly clear.
7	39 56 48	.00 .12 30.08	S	0	S.S.W	0	Partly clear.
8	41 64 53	.05 29.98 29.92	S.W.	3	W	2	Cloudy—rain.
9	54 64 62	29.83 .72 .93	N.W	2	N.W	2	Clear.
10	48 60 46	.75 .74 .90	E	0	S.E	1	Clear—cloudy—rain.
11	41 56 59	.85 .78 .70	N.W	5	N.W	2	Cloudy—clear.
12	59 56 46	.63 .64 .69	W.N.W	3	W.N.W	2	Cloudy—clear.
13	37 32 43	.81 .82 .79	S.W	1	S.S.W	2	Cloudy—clear.
14	36 53 45	.54 .43 .45	W.N.W	2	W.N.W	2	Cloudy—clear.
15	42 46 33	.40 .35 .45	W.N.W	2	N.W	2	Partly clear.
16	20 38 24	.52 .58 .63	S.W	2	W.S.W	2	Cloudy—snow—clear.
17	30 38 32	.63 .61 .70	N.W	2	N.W	2	Partly clear.
18	28 40 34	.78 .80 .95	N.NW	2	N.W	2	Clear—hazy.
19	29 36 25	30.03 30.03 30.03	N.W	1	W.N.W	2	Clear—hazy.
20	22 36 30	.08 .14 .22	W	1	N.W	1	Cloudy–little snow–clear.
21	30 47 45	.22 .14 29.99	E	2	N	1	Clear.
22	44 46 39	29.87 29.76 .74	N.E	2	N.W	1	Clear–cloudy–little rain.
23	31 49 40	.74 .87 .87	W	2	W	1	Partly clear.
24	32 47 41	.93 .90 .86	N	1	E.S.W	0	Partly clear.
25	42 44 38	.64 .59 .35	E.N.E	2	N	1	Cloudy,
26	36 37 30	.58 .70 .93	N.N.W	2	N.W	1	1.55 Rain.
27	26 40 38	.97 .90 .80	W.S.W	2	W	1	Cloudy—some snow.
28	30 40 31	30.00 30.02 30.09	N.N.W	2	N.W	1	Partly clear.
29	30 46 43	.05 .00 29.89	E	1	N	0	Clear.
30	43 45 40	29.84 29.84 .87	N.E	0	E.S.E	1	Partly clear.
					N	1	.10 Slow rain.

The foregoing observations on the thermometer, barometer and winds, are taken three times a day; at sunrise, mid day and 11 P. M.

Note.—In the column representing the force of the wind, 0 denotes calm, or nearly so, 1 a light breeze, 2 a breeze, 3 a wind, 4 a high wind, and 5 a very high wind. The letters R, T and L denote rain, thunder and lightning respectively.

SUMMARY.

Average at sunrise, thermometer	35 70°	—barometer	29.88	inches.	
Do. at mid-day,	do.	47.00°	do.	29 86	do
Do. at 11 P. M.	do.	39.70°	do.	29.86	do.
Monthly mean, (2 obs.)	do.	41 35°	do.	29.87	do.
Maximum, (8th & 9th)	do.	64°	do. 5th	30.29	do.
Minimum, (20th)	do.	22°	do. 15th & 25th	29.35	do.
Range,	do.	44°	do.	1.01	do.
Warmest day, 9th,	do.	59°			
Coldest day, 20th,	do.	23°			

Northerly Winds prevailed, (proportion,)	15 days	Proportion of cloudy weather,	11 days
		Whole days clear,	12
Easterly, do.	7 do.	Days on which rain fell,	5
Southerly, (S to W) do.	8 do.	Quantity of rain,	2.67 in.
Proportion of clear weather,	19 do.		

Observations.—Auroras none. A few faint flashes of lightning were observed in the south-east horizon, on the evening of the 14th. A most extraordinary display of meteors on the morning of the 13th, described in the last number of the Advocate. Winds very light, and tending to the north. Only one high wind in the month. Rains few and generally light; the quantity which fell was unusually small. Snow fell on the 4th, 17th, and 26th, but in small quantity. On the 17th it snowed slowly for nearly two hours. In some parts of the northern states there were several considerable snows. The weather was unusually cold for November, the thermometer averaging about 2° lower than common. On 14 mornings it was below the freezing point. There was nearly always more or less haziness in the atmosphere throughout the month.

Advantages of the militia system of Pennsylvania.—From the account of the Auditor General for 1833, we observe the revenue aring to the state during the year, from "militia and exempt fines" amounts to $1,693, while the *militia expenses* have been $20,776 99!! Truly this is doing a great deal for "*internal improvement*," and yet our citizens want the law *repealed!*

MISCELLANIES.

1. *Instinct of horses.*—During the past winter a gentleman purchased a buffaloe skin while in this city, as an accompaniment to his sleigh. Soon after he started for Wilmington, with two horses attached to it, and the skin hanging over the sides of the sleigh, as they are usually placed. He had not proceeded far before the horses became quite frisky, and exhibited a refractory disposition. Supposing something was the matter with the gearing, he examined it closely, but could discover nothing wrong. He again tried to proceed; but his heretofore quiet and tractable animals openly protested against the measure. Thinking the buffaloe skin might have some influence over them, he took it off and packed it away in the sleigh. They then proceeded quietly enough. Arriving at Chester he concluded to try the skin again. It was accordingly spread out so that the horses could not possibly see it. They again became refractory, and would not proceed till it was taken away; nor could he make any use of it during the whole passage.

2. *Extraordinary Birth.*—On the morning of the 13th instant a lady of Newport, Ky. the wife of Mr. H——, aged about 31 years, and the mother of several fine children, was delivered of female twins. Dr. Bennet, a very respectable medical gentleman, being the family physician, was, at the proper period, called on. He very soon discovered a strange peculiarity and difficulty in the case; and the situation of the lady becoming constantly more and more alarming, and he having without effect resorted to such means as were within his reach, requested the counsel of Dr. Josiah Whiteman, of our city. Dr. W. crossed the river without delay; and in about half an hour after his arrival, the children were born by instrumental assistance, without the least violence being done to the mother. The children were dead, but were of the usual size, and perfect in all respects, except so far as shall be described below, being plump, and handsome, and weighing about six pounds each.

I have had permission to examine these children. They present one of the most uncommon and interesting illustrations of the manner in which nature sometimes sports, or errs, in her operations that I have ever witnessed. These little interesting twin sisters are preternaturally united in a manner very much resembling the far famed Siamese twins. The attachment, however is somewhat more extensive. It commences at the superior portion of the breast bone and extends down to the umbilicus. That of the Siamese twins if I recollect right commences at the *ensiform cartilage* of the sternum, or breast bone, and extends only from that point to the umbilicus. In the case of the Kentucky twins the entire breast bone and ribs of one child are united, by cartilage, to the breast bone and ribs of the other, forming a firm attachment of at least *eight inches*, leaving, however, quite a perfect thoracic and abdominal cavity for each, which are divided by a thin membrane, a reflection of the peritoneum.

Nine months ago the Siamese Twins arrived at Cincinnati, and remained here some time. Mrs. H. although she never saw them, heard much about them, and saw their representation on paper frequently. What influence this Siamese curiosity may have had in the production of the *Lusus Naturæ* of which I now write, I leave for the consideration of those who may think it worthy of notice.

No doubt many grave speculations might be made, on the occasion, by the advocates of the theories of the *Nævi Materni.*

At the request of Dr Whiteman the children have been carefully and delicately preserved in the private anatomical cabinet of Professor Cobb, of the Medical College of Ohio.

I have understood that a full and scientific report of the case, is in preparation by one of the professional gentlemen present, and will be published in a Western Medical Journal. I consider that such a report ably drawn up, as I have no doubt it will be, will not only be curious and interesting, but highly useful to the medical profession.

The mother of the children, I am pleased to have it in my power to say, is doing well. J. M. MASON.

Cincinnati, Nov. 18, 1833.

ADVERTISEMENT.

☞ Books, Pamphlets, Handbills, Cards, Apothecaries' Labels, and every other description of PRINTING, neatly and promptly executed, on the most reasonable terms, at the office of "THE ADVOCATE OF SCIENCE," S. W. corner of Sixth and Cherry streets, Philadelphia.